

# ROLLER MECHANISM FOR SEPARATING PAPER

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

The present invention relates to a roller mechanism for separating paper, and particularly to a roller mechanism applied in a business machine (for example, a laser printer, or a copy machine) for transporting out paper smoothly.

### 2. Description of the Prior Art

The operating principle of all the laser printer or copy machine, referring to the FIG. 1, is making a paper (P) absorbed carbon powder via electric charge, and making the carbon powder fused on the paper (P) by heating via a heating mechanism (H). The heating mechanism (H) is mounted in a fusing roller 2a. A follower roller 3a which is assembled under the fusing roller 2a exerts pressure upon another surface of the paper (P). Because of the carbon powder, the paper (P) will easily adhere to the fusing roller 2a when the fusing roller 2a heats the paper (P). Therefore, it needs a paper-separating mechanism for separating the paper (P) from the fusing roller 2a.

The fusing roller 2a of prior art comprises a pivoting device 4a which is disposed adjacent a paper outlet 5a, and a plurality of separating claws 6a which are pivoted on an end of the pivoting device 4a. The separating claws 6a are respectively formed with a sharp tip, and the sharp tips are contact with the surface of the fusing roller 2a. When the paper (P) passes the fusing roller 2a, the separating claws 6a separates the paper (P) from the fusing roller 2a, and the paper (P) is guided along the separating claws 6a to the paper outlet 5a.

However, the separating claws 6a of the prior art must be disposed accurately, each of the separating claws 6a must closes to the surface of the fusing roller 2a accurately. If one of the separating claws 6a is not closed, the paper (P) will probably adhere to the fusing roller 2a and roll thereon, even the  
5 paper (P) will wrap around the fusing roller 2a. At that time, it usually need to dismantle a rear panel of the laser printer and take the paper (P) out carefully to avoid injuring the separating claws 6a and the fusing roller 2a. Besides, it must consider particularly the material of the separating claws 6a for withstanding high temperature and not injuring the fusing roller 2a. Therefore the cost and  
10 accurateness requirement of the prior art are high.

Hence, an improved roller mechanism for separating paper is required to overcome the disadvantages of the prior art.

### **SUMMARY OF THE INVENTION**

An object of the present invention is to provide a paper-separating roller  
15 mechanism which is applied in business machine for simplifying structure and for assuring paper transported smoothly after image formed on the paper.

In order to achieve the above objects, the present invention according to one aspect thereof provides a roller mechanism for separating paper. The roller mechanism comprises a fusing roller formed with at least two annular grooves  
20 on a periphery thereof; at least two paper-separating rings respectively mounted in the annular grooves correspondingly; and a following roller contiguous to the fusing roller.

## **BRIEF DESCRIPTION OF THE DRAWINGS**

The invention will be better understood and objects other than those set forth above will become apparent when consideration is given to the following detailed description thereof. Such a description makes reference to the annexed  
5 drawings wherein:

FIG. 1 is a side view of a paper-separating mechanism of prior art;

FIG. 2 is a side view of a paper-separating mechanism of the invention;

FIG. 3 is a perspective view of the first embodiment of an annular groove and a paper-separating ring; and

10 FIG. 4 is a perspective view of another embodiment of the annular groove and the paper-separating ring.

## **DESCRIPTION OF THE PREFERRED EMBODIMENT**

Referring to FIG.2, it is a side-view of the present invention of the paper-separating mechanism. The roller mechanism 1 is mounted in a business  
15 machine 2, and adjacent to an paper outlet 40. The paper outlet 40 has a guiding mechanism 50. The business machine 2 could be a laser printer, copy machine, or any machine that need a paper-separating mechanism.

The paper-separating mechanism comprises a fusing roller 10 which is assembled with a heat mechanism (H) therein for heating the fusing roller 10,  
20 and a following roller 30 which is mounted under the fusing roller 10. The fusing roller 10 and the following roller 30 are contiguous to each other and respectively rotating along the center of a circle thereof. Therefore, after transporting a paper (P) through the fusing roller 10, the carbon powder that has been absorbed on the paper will fuse on the paper (P).

The fusing roller 10 is formed with at least two annular grooves 12 on a periphery thereof. At least two paper-separating rings 20 are respectively mounted in the corresponding annular grooves 12. The annular grooves 12 are parallel and formed along diameter-paths of the fusing roller 10, and have the same cross-section. The surface of the paper-separating rings 20 is coplanar with the surface of the fusing roller 10 after the paper-separating rings 20 are assembled in the annular grooves 12. A diameter of the paper-separating ring 20 is larger than that of the fusing roller 10.

The following roller 30 can be assembled above the fusing roller 10, so the paper-separating rings 20 will hang down on the fusing roller 10 naturally by gravity and do not need too much width.

Referring to the FIG. 3, which is a first embodiment of the annular groove and paper-separating ring of the present invention. The cross-section of the annular groove 20 along a diameter thereof could be a rectangular groove, and the cross-section of the paper-separating ring 20 along its diameter is mating with the rectangular groove.

Referring to the FIG. 4, which is another embodiment of the annular groove and paper-separating ring. The cross-section of the annular groove 20 along a diameter thereof could be a curve groove, and the cross-section of the paper-separating ring 20 along a diameter thereof is mating with the curve groove.

Wherein the paper-separating rings 20 are made of heat-conductible material.

By the above describing, it is manifest that the present invention simplifying the paper-separating mechanism of the prior art. By means of the annular paper-separating rings, the paper is easily and assuredly to separate

from the fusing roller. The structure of the paper-separating ring is simple and easily to manufacture, it is obvious to reduce the manufacturing cost. In any case, the paper is certain to separate from the fusing roller, and effectively reduce the failure rate. In the prior art, if any one of the separating claw is not  
5 contiguous to the fusing roller, the paper will roll up and adhere to the surface of the fusing roller.

It is to be understood, however, that even though numerous characteristics and advantages of the present invention have been set forth in the foregoing description, together with details of the structure and function of the invention,  
10 the disclosure is illustrative only, and changes may be made in detail, especially in matter of shape, size, and arrangement of parts within the principles of the invention to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.